

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION**

WRIGHT ASPHALT PRODUCTS CO.,
LLC,

Plaintiff,

v.

PELICAN REFINING COMPANY, LLC,

Defendant.

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CIVIL ACTION NO. H-09-1145

CLAIM CONSTRUCTION MEMORANDUM OPINION AND ORDER

Wright Asphalt Products Co., LLC sued Pelican Refining Company, LLC, alleging that its manufacture and sale of certain modified asphalt products literally infringed claims in two patents. Pelican counterclaimed, alleging invalidity and unenforceability. This memorandum opinion addresses the parties' contentions about how to construe disputed terms in the patent claims. The parties have submitted a tutorial, briefs, and exhibits. This court held a hearing under *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996), at which experts designated by both parties expressed opinions on the disputed terms.

The patents at issue are U.S. Patent No. 5,397,818 (the '818 Patent) and U.S. Patent No. 5,492,561 (the '561 Patent), which describe processes for making asphalt products using recycled tire rubber and asphalt and the products. Wright and Pelican compete in manufacturing and selling asphalt products.

Based on the briefs, the record, the arguments of counsel, and the applicable law, this court construes the disputed terms as set out in the following table:

<p>Claims 11 to 13, '818 Patent</p> <p>“incorporated” asphalt composition</p> <p>“incorporated” into</p>	<p>“incorporated” means homogenous and stable.</p> <p>“incorporated” means combined so as to be homogenous and stable.</p> <p>(The parties have agreed that “stable” means “a composition that does not separate into component parts in storage.”)</p>
<p>Claims 11 and 12, '818 Patent; Claim 4, '561 Patent</p> <p>“%”</p>	<p>“%” means percent by weight of the final product.</p>
<p>Claim 13, '818 Patent; Claim 6, '561 Patent</p> <p>“synthetic rubber”</p>	<p>“synthetic rubber” means rubber manufactured from petroleum and other chemicals rather than the product of raw rubber extracted from rubber vegetation.</p>
<p>Claim 1, '561 Patent</p> <p>“fully incorporated”</p>	<p>“fully incorporated” means combined so as to be homogenous and stable.</p>
<p>Claim 1, '561 Patent</p> <p>“completely integrated”</p>	<p>“completely integrated” has the same meaning as “fully incorporated.”</p>
<p>Claims 1, 2, and 4, '561 Patent</p> <p>“asphalt medium”</p>	<p>“asphalt medium” means asphalt of any type into which a substance may be added.</p> <p>(The parties have agreed that “asphalt” means a dark bituminous substance that is found in natural beds and is also obtained as a residue in petroleum refining and that consists chiefly of hydrocarbons.)</p>

Claim 1, '561 Patent “bottom portion”	“bottom portion” means an area below a middle portion.
Claim 1, '561 patent “middle portion”	“middle portion” means an area above a bottom portion in which the jet spray nozzles provide sufficient shear to mix the contents.
Claim 1, '561 Patent “jet spray nozzles”	“jet spray nozzles” means devices or structures with an aperture capable of providing a propulsion spray of the material passing through it.
Claim 5, '561 Patent “mixing”	“mixing” has its ordinary meaning of “combining” or “blending.”
Claim 7, '561 Patent “blending”	“blending” has its ordinary meaning of combining or mixing so thoroughly that the constituent parts cannot readily be distinguished from one another.
Claim 7, '561 Patent “polymer material”	“polymer material” has its ordinary meaning of material made by polymerization.
Claim 8, '561 Patent “holding vessel”	“holding vessel” is a vessel that receives the incorporated asphalt composition.

Pelican has also filed a motion to amend its answer in response to information gathered during discovery. (Docket Entry No. 55). Wright has responded, requesting oral argument, (Docket Entry No. 56), and Pelican has replied, (Docket Entry No. 57). A hearing and scheduling conference

is set for **March 10, 2011**, at 5:00 p.m. The parties should be prepared to address scheduling issues and the motion to amend.

The reasons for the claim construction are explained below.

I. Background

The substance commonly known as asphalt is produced during the refining of petroleum crude oil. Since the 1960s, many manufacturers have modified asphalt to make it more useful in its primary applications as the “glue” in asphalt concrete used to pave roads and as roofing material. The primary modification is to add rubber particles to make asphalt products that are mixed according to specific formulations. The formulations are designed in a binder laboratory that determines the proper mixture for various paving applications.

Early asphalt products that blended asphalt cement and reclaimed tire rubber retained the particulate nature of the rubber. As a result, the rubber particles and the asphalt tended to separate over time. The vulcanization process makes rubber rigid and difficult to combine with asphalt to make a stable mixture. Early methods addressing this problem by devulcanizing the rubber used to make asphalt cement were expensive and ineffective.

Wright owns the two patents at issue in this suit. Both patents list Theodore P. Flanigan as the inventor. The '818 Patent issued on March 14, 1995. According to the summary of the invention in the '818 Patent, “[t]he invention provides a process for preparing tire rubber modified asphalt cement systems and products thereof which have only two components, distillation tower bottoms . . . and ground tire rubber No chemicals or special aromatic oils or additives are needed in this process.” '818 Patent, col.1 ll.60–65. The '818 Patent consists of process claims, product claims, and product-by-process claims. The product claimed in the '818 Patent is a two-

member composition of distillation tower bottoms and ground tire rubber. The process is an air-blown process to oxidize the mixture to mix the tire rubber into the distillation tower bottoms, forming a homogenous product that is stable over time and does not separate into the component parts.

The '561 Patent issued on February 20, 1996 and claims another process to make asphalt cement. According to the description of the invention, it is "[a] process for liquefying whole tire rubber by incorporating into an asphalt medium to obtain a fully incorporated, homogenous, stable composition, without oxidation or air-blowing, and a product of the process." '561 Patent col.1 ll.7–10. This process combines heat and "shear" to break down the rubber to absorb it into asphalt. It differs from the '818 Patent primarily by the absence of oxidization and air-blowing. Both patents claim products that do not use additives.

The Patent and Trademark Office (PTO) initially rejected the '818 Patent as unpatentable over prior art. The inventor amended the claims to overcome the rejection. The inventor also submitted statements explaining why the invention was not obvious. The amendments and the statements form the basis of the parties' primary claim construction dispute. Wright argues that Pelican's proposed construction of terms in the '818 product claims is improperly limited to a particular process. Pelican responds that the inventor's amendments and statements in the prosecution history require incorporating process limitations into what are written as product claims.

The '818 Patent has fifteen claims. Claims 1 to 10 are process claims. Claims 11, 12, and 13 are product claims. Claims 14 and 15 are product-by-process claims that refer back to Claims 1 and 8, respectively, and are dependent on the process by which the product is made. The claims are as follows:

1. A process for preparing an incorporated asphalt composition consisting essentially of the steps of:

A. mixing ground tire rubber with distillation tower bottoms to form a wetted mixture of the ground tire rubber with the distillation tower bottoms;

B. bombarding the wetted mixture of ground tire rubber and distillation tower bottoms with air at a temperature of about 350°–485°F. at about 6–15 psi pressure;

C. abrasively absorbing the ground tire rubber into the distillation tower bottoms until the mixture is homogenized and a stable incorporated asphalt composition is formed;

D. recovering the incorporated asphalt composition.

2. A process according to claim **1** wherein about 1–27% ground tire rubber is mixed into about 73–99% distillation tower bottoms.

3. A process according to claim **1** wherein about 12–25% ground tire rubber is mixed into about 75–88% distillation tower bottoms.

4. A process according to claim **1** wherein the air bombardment is carried out for about 2–6 hours.

5. A process according to claim **1** wherein the air bombardment is carried out at about 1600–2800 cfm.

6. A process according to claim **1** wherein the air bombardment is carried out at about 2000–2400 cfm.

7. A process according to claim **1** wherein the air for bombarding the wetted mixture is injected through a stationary spider-shaped injector device.

8. A process according to claim **1** wherein the ground tire rubber includes at least one rubber selected from the group consisting of natural rubber and synthetic rubber.

9. A process for preparing an incorporated asphalt composition consisting essentially of the steps of:

B. injecting air at a temperature of about 350°–485° at a flow rate of about 1600–2800 cfm and about 6–15 psi pressure for about 2 to 6 hours through a stationary spider-shaped device;

C. bombarding the wetted mixture of ground tire rubber and distillation tower bottoms with the injected air;

D. abrasively absorbing the ground tire rubber into the distillation tower bottoms until the mixture is incorporated;

E. recovering the incorporated asphalt composition.

10. A process according to claim **9** wherein the ground tire rubber includes at least one rubber selected from the group consisting of natural rubber and synthetic rubber.

11. An incorporated asphalt composition consisting essentially of about 1–27% ground tire rubber incorporated into about 73–99% distillation tower bottoms.

12. An incorporated asphalt composition according to claim **11** consisting essentially of about 12–25% ground tire rubber incorporated into about 75–88% distillation tower bottoms.

13. An incorporated asphalt composition according to claim **11**, wherein the ground tire rubber includes synthetic rubber.

14. An incorporated asphalt composition made by a process according to claim **1**.

15. An incorporated asphalt composition made by a process according to claim **8**.

'818 Patent, col. 5 l.60–col.6 l.61.

The parties dispute three terms in Claims 11 to 13 of the '818 Patent: “incorporated,” as used in “incorporated asphalt composition” and “incorporated into”; “%”; and “synthetic rubber.” The terms appear as follows in the disputed claims:

11. An *incorporated* asphalt composition consisting essentially of about 1–27% ground tire rubber *incorporated* into about 73–99% distillation tower bottoms.

12. An *incorporated* asphalt composition according to claim **11** consisting essentially of about 12–25% ground tire rubber *incorporated* into about 75–88% distillation tower bottoms.

13. An *incorporated* asphalt composition according to claim **11**, wherein the ground tire rubber includes *synthetic rubber*.

Id. col. 6 ll. 48–57 (italics added).

The '561 Patent contains nine claims. Disputed terms appear in every claim except Claims 2 and 3.

These terms appear as follows in the '561 Patent:

1. A process for preparing a *fully incorporated* asphalt composition comprising:

introducing *asphalt medium* into a reactor vessel; introducing whole tire rubber granules into the *asphalt medium* to form a mixture of the *asphalt medium* and the whole tire rubber granules;

circulating part of the mixture from *a middle portion* of the reactor vessel into *a bottom portion* of the reactor vessel through *jet spray nozzles* until the whole tire rubber granules are *completely integrated* into the *asphalt medium*; and

forming a stable, *fully incorporated* asphalt composition.

2. A process according to claim 1 further comprising circulating the asphalt medium from the reactor vessel through a heat exchanger to increase temperature of the asphalt medium to about 500°F.

3. A process according to claim 1 comprising maintaining the temperature in the reactor vessel at about 485°–510° F.

4. A process according to claim 1 comprising mixing about 10–20% whole tire rubber particles into about 80–90% asphalt medium.

5. A process according to claim 1 comprising *mixing* in the reactor vessel for about 5 to 10 hours.

6. A process according to claim 1 wherein the whole tire rubber comprises at least one rubber material selected from natural rubber and *synthetic rubber*.

7. A process according to claim 1 comprising modifying the asphalt composition by *blending polymer material* therein.

8. A process according to claim 1 further comprising pumping the formed asphalt composition into a *holding vessel*.

9. A process for preparing a fully incorporated asphalt composition comprising:

introducing *asphalt medium* into a reactor vessel;

introducing whole tire rubber granules into the asphalt medium to form a mixture of 10–20% whole tire rubber granules and 80–90% asphalt medium;

circulating part of the mixture at a temperature of about 485°–510 °F. from *a middle portion* of the reactor vessel into *a bottom portion* of the reactor vessel through two *jet spray nozzles* which discharge the mixture in opposite directions until the whole tire rubber granules are completely integrated into the asphalt medium; and

forming a stable, *fully incorporated* asphalt composition.

'561 Patent, col.9 l.6–col. 10 l. 26 (emphasis added).

The parties dispute the twelve italicized terms in the '561 Patent claims: “asphalt medium,” “a middle portion,” “a bottom portion,” “jet spray nozzles,” “fully incorporated,” “completely integrated,” “%,” “mixing,” “synthetic rubber,” “blending,” “polymer material,” and “holding vessel.”

This court held a *Markman* hearing to consider the parties' evidence and arguments on July 16, 2010. Wright filed a claim-construction brief, (Docket Entry No. 34), Pelican responded, (Docket Entry No. 36), and Wright replied, (Docket Entry No. 40). Wright called one expert witness

to testify at the hearing. Gayle N. King holds a Ph.D. in physical chemistry and has years of experience in the asphalt industry. He has worked as a “binder formulator,” responsible for devising asphalt cements to meet client specifications. He is now a consultant for his own company, GHK, Inc., through which he primarily provides technical expertise in binder formulation to clients. Pelican called two expert witnesses. One, Serji N. Amirkhanian, is a professor of transportation and director of the Asphalt Rubber Technology Service at Clemson University in South Carolina. He holds a Ph.D. in civil engineering and teaches courses on pavement design and asphalt concrete properties. The other expert Pelican called is Keith N. Rockey, a former patent examiner who testified about PTO procedures. Rockey did not purport to have or to be familiar with the knowledge of a person with ordinary skill in the relevant art.

The parties jointly submitted a set of exhibits. Those exhibits include: the ’818 Patent and its prosecution history, Joint Exs. 1 and 1A; the ’561 Patent and its prosecution history, Joint Exs. 2 and 2A; Wright’s Tutorial for the Technology of the Patents in Suit, Joint Ex. 3; Dr. King’s expert report and resume, Joint Exs. 4 and 4B; Dr. Amirkhanian’s resume, Joint Ex. 5; Rockey’s resume; Joint Ex. 6; and the Amended Joint Claim Construction Chart, Joint Ex. 7. The parties supplemented the joint exhibits with drawings produced by Dr. King and Dr. Amirkhanian during the *Markman* hearing, Joint Exs. 25 and 26.

II. The Applicable Legal Standards

The standards governing patent claim construction are well established. Under Federal Circuit law, it is a “bedrock principle” that “the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d

1111, 1115 (Fed. Cir. 2004)). “[T]he construction of a patent, including terms of art within its claim, is exclusively within the province of the court.” *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996). To determine the rights secured by a patent, the court reads the patent from the vantage of the person having ordinary skill in the art at the time of the invention. *Phillips*, 415 F.3d at 1313. The person having ordinary skill in the art “is deemed to read the words used in the patent documents with an understanding of their meaning in the field, and to have knowledge of any special meaning and usage in the field.” *Id.* (quoting *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998)); *see also Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) (cautioning not to interpret claim terms “in a vacuum”).

Claim terms are “generally given their ordinary and customary meaning.” *Id.* at 1312 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). This refers to “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. When the ordinary meaning of claim language is readily apparent, claim construction “involves little more than the application of the widely accepted meaning of commonly understood words.” *Id.* at 1314. If this meaning is, however, not readily apparent, the court should review “the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the prosecution history.” *Vitronics*, 90 F.3d at 1582. First, the court should “look to the words of the claims themselves, both asserted and nonasserted, to define the scope of the patented invention.” *Id.* Second, the court should “review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning.” *Id.*

The Federal Circuit has repeatedly stated that “claims ‘must be read in view of the specification, of which they are part.’” *Phillips*, 415 F.3d at 1315 (quoting *Markman*, 52 F.3d at 979). The specification is “the best source for understanding a technical term.” *Id.* (quoting *Multiform Desiccants*, 133 F.3d at 1478) (alterations omitted); *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1360 (Fed. Cir. 2004) (“In most cases, the best source for discerning the proper context of claim terms is the patent specification wherein the patent applicant describes the invention.”). The Federal Circuit has referred to the specification as a “concordance for the claims.” *Phillips*, 415 F.3d at 1315 (quoting *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 397–98 (Ct. Cl. 1967)). When the specification “reveal[s] a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess . . . the inventor’s lexicography governs.” *Id.* at 1316 (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). “In other cases, the specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor.” *Id.* (citing *Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1343–44 (Fed. Cir. 2001)). “The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Id.* (quoting *Renishaw PLC v. Marposs Società per Azioni*, 158 F.3d, 1243, 1250 (Fed. Cir. 1998) (citations omitted)).

“A court ‘should also consider the patent’s prosecution history, if it is in evidence.’” *Id.* at 1317 (quoting *Markman*, 52 F.3d at 980). The prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Id.* (citing *Vitronics*, 90 F.3d at 1582–83). The prosecution history includes

“all express representations made by or on behalf of the applicant to the examiner to induce a patent grant, or . . . to reissue a patent . . . includ[ing] amendments to the claims and arguments made to convince the examiner that the claimed invention meets the statutory requirements of novelty, utility, and nonobviousness.” *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985); *see also Phillips*, 415 F.3d at 1317. “The doctrine of prosecution disclaimer is well established in Supreme Court precedent, precluding patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution.”¹ *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003) (citing cases). The doctrine does not apply “where the alleged disavowal of claim scope is ambiguous.” *Id.* at 1371; *see also id.* at 1325 (“[W]e have required the alleged disavowing statements to be both so clear as to show reasonable clarity and deliberateness and so unmistakable as to be unambiguous evidence of a disclaimer.” (citations omitted)). Only when “the patentee has unequivocally disavowed a certain meaning to obtain his patent [does] the doctrine of prosecution disclaimer attach[] and narrow the ordinary meaning of the claim congruent with the scope of the surrender.” *Id.* at 1324 (citing cases). The doctrine applies even if the

¹ “There is a distinction between using the contents of the prosecution history to reach an understanding about disputed claim language, and the doctrine of prosecution history estoppel which ‘estops’ or limits later expansion of the protection accorded by the claim to the patent owner under the doctrine of equivalents when the claims have been purposefully amended or distinguished over relevant prior art to give up scope. . . . [T]he two uses of the prosecution history must not be confused.” *Biodex Corp. v. Loredan Biomedical, Inc.*, 946 F.2d 850, 862 (Fed. Cir. 1991) (citations and quotation marks omitted); *see also Ballard Med. Prods. v. Allegiance Healthcare Corp.*, 268 F.3d 1352, 1358–59 (Fed. Cir. 2001) (distinguishing the two); *Spectrum Int’l Corp. v. Sterilite Corp.*, 164 F.3d 1372, 1378 n.2 (Fed. Cir. 1998) (same); *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1578 (Fed. Cir. 1995) (same). “Just as prosecution history estoppel may act to estop an equivalence argument under the doctrine of equivalents, positions taken before the PTO may bar an inconsistent position on claim construction” *Ballard Med. Prods.*, 268 F.3d at 1359 (quoting *Cybor Corp. v. FAS Techs., Inc.* 138 F.3d 1448, 1457 (Fed. Cir. 1998) (alterations omitted)). When, as here, the accused infringer argues that the prosecution history results in a narrowing of a claim’s scope, there is no difference, and the Federal Circuit has refused to reverse based on references to estoppel. *See id.* at 1358–59 (“Because the substance of the district court’s analysis was sound, we disregard the fact that the court used the term ‘prosecution history estoppel’ in an unconventional manner.”); *Biodex Corp.*, 946 F.2d at 862–63 (“observing that “Biodex is technically correct in asserting that the doctrine of prosecution history estoppel is ‘irrelevant’ to determination of literal claim scope” but upholding the district court because prosecution history is relevant to claim interpretation (citations omitted)).

concessions were not necessary to make the invention patentable. *Cf. Southwell Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1583 (Fed. Cir. 1995) (“Estoppel extends beyond the basis of patentability Clear assertions made during prosecution in support of patentability, whether or not actually required to secure allowance of the claim, may also create an estoppel.” (citing *Tex. Instruments, Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165 (Fed. Cir. 1993))).

When the patent prosecution history includes a statement from the inventor that a process is necessary to obtain a product, the inventor disclaims methods of producing that product that do not involve that step. *See, e.g., Andersen Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1372 (Fed. Cir. 2007) (construing product claim as to include process limitations because the specification used “language of requirement, not preference”); *Chimie v. PPG Indus., Inc.*, 402 F.3d 1371, 1385 (Fed. Cir. 2005) (construing claim to require unrecited feature where applicant told examiner that such feature “must be used”); *see also PolyVision Corp. v. Smart Techs. Inc.*, Nos. 1:03-CV-476, 1:04-CV-713, 2007 WL 2683516, at *1 (W.D. Mich. Sept. 7, 2007) (describing these principles as “well-established”); *but see ResQNet.com, Inc. v. Lansa, Inc.*, 346 F.3d 1374, 1383 (Fed. Cir. 2003) (“The presence of ‘not critical’ and ‘may’ indicates a preference, not a requirement.”). But not “[e]very statement made by a patentee during prosecution to distinguish a prior art reference . . . create[s] a separate estoppel. Arguments must be viewed in context.” *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 824 (Fed. Cir. 1992). If the attributes are merely “cited as advantageous,” that fact alone does not “convert product claims into claims limited to a particular process.” *Vanguard Prods. Corp. v. Parker Hannfin Corp.*, 234 F.3d 1370, 1372 (Fed. Cir. 2000); *see also Abbott Labs. v. Baxter Pharm. Prods., Inc.*, 334 F.3d 1274, 1280 (Fed. Cir. 2003) (holding that prosecution history estoppel did not apply when “Abbott never expressly represented that a particular

concentration range of Lewis acid inhibitor was critical to distinguishing its claimed invention over” the prior art).

Courts may also “rely on extrinsic evidence, which ‘consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.’” *Phillips*, 415 F.3d at 1317 (quoting *Markman*, 52 F.3d at 980). The Federal Circuit has instructed that extrinsic evidence is “less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’” *Id.* at 1317 (quoting *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 862 (Fed. Cir. 2004)). Relevant extrinsic evidence may include “all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Id.* at 1317 (quoting *Markman*, 52 F.3d at 980). Extrinsic evidence, however, is “in general . . . less reliable than the patent and its prosecution history” because it is not part of the patent and was not created at the time of the patent’s prosecution; extrinsic publications may not have been written by or for skilled artisans; and expert reports and testimony created at the time of litigation may suffer from bias not present in intrinsic evidence. *Id.* at 1318. For these reasons, a district court must exercise “sound discretion” in admitting and using extrinsic evidence. *Id.* at 1319; *Seattle Box Co. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984) (“A trial judge has sole discretion to decide whether or not he needs, or even just desires, an expert’s assistance to understand a patent. We will not disturb that discretionary decision except in the clearest case.”).

“[E]xtrinsic evidence may be useful to the court, but it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Phillips*, 415 F.3d at 1319. Although it is generally permissible for a court to consider extrinsic evidence, it must ensure that such evidence does not relegate the intrinsic evidence to a mere “check

on the dictionary meaning of a claim term.” *Id.* at 1320; *see also id.* (noting that relying on dictionaries “too often” causes “the adoption of a dictionary definition entirely divorced from the context of the written description”). “The sequence of steps used by the judge in consulting various sources is not important; what matters is for the court to attach the appropriate weight to be assigned to those sources in light of the statutes and policies that inform patent law.” *Id.* at 1324 (citing *Vitronics*, 90 F.3d at 1582).

The district court’s obligation to construe claims does not extend to “terms with ordinary meanings, lest trial courts be inundated with requests to parse the meaning of every word in the asserted claims.” *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360 (Fed. Cir. 2008); *see also Silicon Graphics, Inc. v. ATI Techs., Inc.*, 607 F.3d 784, 798 (Fed. Cir. 2010) (“The testimony of both sides’ experts at trial indicates that that term was not fundamentally in dispute, thus, it was proper for the district court not to construe it.”); *Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc.*, 249 F.3d 1341, 1349 (Fed. Cir. 2001) (finding no error decision not to construe “melting”); *Mentor H/S, Inc. v. Med. Device Alliance, Inc.*, 244 F.3d 1365, 1380 (Fed. Cir. 2001) (finding no error in the court’s refusal to construe “irrigating” and “frictional heat”); *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) (explaining that claim construction “is not an obligatory exercise in redundancy”). “A determination that a claim term ‘needs no construction’ or has the ‘plain and ordinary meaning’ may be inadequate when a term has more than one ‘ordinary’ meaning or when reliance on a term’s ‘ordinary’ meaning does not resolve the parties’ dispute.” *O2 Micro*, 521 F.3d at 1361. For some terms, the subject of the parties’ dispute is not the appropriate meaning, but whether the terms should be defined for the jury at all.

This court has construed the disputed terms; whether instruction on the terms is needed as part of jury instructions will be determined later in this case.

III. Analysis

A. The '818 Patent

The parties three terms that appear in Claims 11 to 13: “incorporated,” “%,” and “synthetic rubber.” Each is analyzed below.

1. “incorporated”

The first disputed term is “incorporated” as used in Claims 11 to 13. The term is used in the phrases “incorporated asphalt composition” and “incorporated into.” Wright argues that in the first phrase, “incorporated” describes a structural characteristic of the product and does not limit the claim to the process used to create that product. According to Wright, any mixture that is “incorporated” and meets the other limitations in Claims 11 to 13 is within the meaning of this term. Wright argues that “incorporated” in this phrase means “homogenous and stable.” Pelican’s definition is much narrower: “a wetted mixture of ground tire rubber and distillation tower bottoms into which, in an absorption vessel, pressurized air is pumped in order for the air to abrasively bombard the heated, wetted mixture until a target softening point is reached when the product is completely incorporated and homogenized. The tire rubber and asphalt are not simply heated and melted together with agitation.” The parties have a similar dispute over the meaning of “incorporated” in the phrase “incorporated into.”

This disputes over the meaning of “incorporated” are essentially over whether Claims 11 to 13 of the '818 Patent are product claims or product-by-process claims. If they are product claims, then they cover any product that bears the characteristics set out in the claim regardless of the process used to make the product. If they are product-by-process claims, then competitors may

make the same product, so long as they do so by a different process. *See Abbott Labs. v. Sandoz, Inc.*, 566 F.3d 1282, 1293 (Fed. Cir. 2009) (en banc) (“[T]his court now restates that ‘process terms in product-by-process claims serve as limitations in determining infringement.’” (quoting *Atl. Thermoplastics Co. v. Faytex Corp.*, 970 F.2d 834, 846–47 (Fed. Cir. 1992))).

Pelican primarily relies on the prosecution history to argue that “incorporated” means not only a characteristic of the product but also the specific process used to create it. Pelican points to the amendments and statements the inventor presented during the prosecution history. Wright asserts that the amendments and statements do not add process limitations to the product claims because the examiner rejected each type of claim separately, for separate reasons, and the inventor’s amendments and statements were also separately directed to each type of claim. In short, Wright argues that Pelican is taking amendments and statements presented in response to the rejection of process claims and using them to support an unduly limited construction of the product claims.

The specification describes the product as a “completely incorporated mixture” of ground tire rubber and distillation tower bottoms, with the ground tire rubber incorporated into the distillation tower bottoms. The result is a “homogenized asphalt product.” ’818 Patent, Abstract. The specification also describes the product as a “composite” of the two components, distillation tower bottoms and ground tire rubber, “completely incorporated together” that “is stable.” *Id.* col.2 ll.1–4. Other places in the specification similarly describe the product. *See, e.g., id.* col.2 ll.54–57 (“The product is an asphalt composition in which the ground tire rubber is fully incorporated into the distillation tower bottoms. The resulting composition is stable and does not separate out.”). The specification also describes the process of the invention, using abrasive absorption to combine the tire rubber and the residue by bombarding with a high volume of air under pressure. *Id.* col.1 ll.66–68; col.2 l.1.

Claims 11 to 13 were initially rejected. As originally submitted, they read:

11. An incorporated asphalt composition consisting essentially of about 1–27% ground tire rubber and about 73–99% distillation tower bottoms.

12. An incorporated asphalt composition according to claim 11 consisting essentially of about 12–25% ground tire rubber and about 75–88% distillation tower bottoms.

13. An incorporated asphalt composition according to claim 11, wherein the ground tire rubber includes synthetic rubber.

(Joint Ex. 1A at 27). The examiner rejected Claims 1 to 15 of the '818 Patent in light of the prior art. *See* 35 U.S.C. § 103(a) (“A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made . . .”). The examiner rejected all claims in the original application on the ground that the process and products were obvious in light of three patents: U.S. Patent Nos. 4,166,049, 4,358,554, and 4,430,464. The examiner explained:

As far as the composition is concerned the composition claimed consists of asphalt and particulate rubber. Whether the asphalt comes from distillation tower bottoms or not, is immaterial. Whether the rubber comes from tires or not is not relevant. As far as the process is concerned, the examiner holds, that it is simply heating and melting together rubber and asphalt with agitation. There was no showing of the criticality for the use of hot air under specified pressure. Also there was no showing of criticality as far as the cited concentrations of rubber and asphalt are concerned. The cited references all show rubber and asphalt mixed together with heat and agitation. The examiner holds, that without proof of superiority all sources of heat or modes of mixing are obvious. The examiner also holds, that since there is no proof of superiority for the product of the claimed process, any blend of molten rubber and asphalt will read on applicant's claims.

(Joint Ex. 1A at 41).

In response, the inventor amended Claims 11 to 13, along with other rejected claims. In Claims 11 to 13, the inventor replaced the word “and” in each claim with the words, “incorporated into.” *Id.* at 45–46. The amendment is set out with the deleted and added language, as follows:

11. An incorporated asphalt composition consisting essentially of about 1–27% ground tire rubber ~~and~~ *incorporated into* about 73–99% distillation tower bottoms.

(*Id.* at 27).

Claim 1, which is an independent process claim, was also amended. The amendment added an abrasive absorption step, as follows:

C. abrasively absorbing the ground tire rubber into the distillation tower bottoms until the mixture is homogenized and a stable incorporated asphalt composition is formed.

(*Id.* at 45 (underlining omitted)).

The amendments were accompanied by an explanation of why the original denial was incorrect and why the amended application should be approved. The parties dispute whether these remarks lead to the narrower definition of “incorporated asphalt composition” that Pelican advocates. The relevant remarks the inventor submitted to the PTO read:

The invention is a process for preparing tire rubber modified asphalt cement systems by incorporating ground tire rubber into distillation tower bottoms using abrasive absorption facilitated by bombardment with air under pressure to achieve a stable asphalt cement system, and products thereof. A wetted mixture of ground tire rubber and distillation tower bottoms is bombarded with air at a temperature of 350°–485°F and about 6 to 15 psi pressure. The ground tire rubber is abrasively absorbed into the distillation tower bottoms until the mixture is homogenized and an incorporated asphalt composition is formed. The bombardment of the mixture of ground tire rubber and distillation tower bottoms with air under the claimed conditions of heat and pressure abrades the mixture and forces the ground tire rubber to be absorbed into the distillation tower bottoms until the mixture is homogenized. An incorporated asphalt is formed which is stable and does not separate out into its components.

Id. at 46. The inventor's remarks continue:

The Examiner has asserted that the claimed process is simply heating and melting together rubber and asphalt with agitation and that there is no showing of criticality for the use of hot air under specified pressure or for the cited concentrations of rubber and asphalt. Applicant respectfully traverses the Examiner's assertions. It is essential to the claimed invention that the rubber and asphalt are not simply heated and melted together with agitation. The process requires that pressurized air be pumped into the absorption vessel in order for the air to abrasively bombard the wetted mixture of ground tire rubber and distillation tower bottoms, as claimed. The temperature and air flow are maintained until a target softening point is reached when the product is completely incorporated and homogenized. No chemicals or additional aromatic oils or additives, such as catalyst, are needed. Criticality is described in the specification, page 11, lines 1–3, in which it is stated that if an insufficient quantity of air is used or if the residence time in the abrasive absorption vessel is insufficient, the product is not properly incorporated and is liable to separate out. . . .

The cited references are discussed in detail below. None of the references describes the process limitations of injecting air under pressure, bombarding with air and abrasively absorbing the ground tire rubber into the distillation tower bottoms under the bombarding action of the injected air, as claimed. With respect to the product claims, none of the references cited provide a product which is "incorporated" as defined in the specification, page 4, lines 21–24, as an "asphalt composition in which the ground tire rubber is fully incorporated into the distillation tower bottoms." This clearly states the distillation tower bottoms is the carrier for the ground tire rubber.

Id. at 47–48 (underlining in original).

Wright cites *MBO Laboratories, Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323 (Fed. Cir. 2007), to argue that essential features cannot be read into the claims without textual support. In *MBO Laboratories*, the parties disputed the meaning of the word "immediately" in several patent claims. *Id.* at 1328. The district court concluded that the term had a specific meaning and applied that meaning to claims that contained the word "immediately" and to claims that did not. *Id.* The Federal Circuit approved the limitation as to the claims that used the word "immediately" but

disagreed with importing those limitations into the claims that did not use the word, finding that none of the disputed terms in those claims could reasonably bear the limitation. *Id.* at 1330–31 (“[W]e cannot endorse a construction analysis that does not identify ‘a textual reference with which to associate a proffered claim construction.’” (quoting *Johnson Worldwide*, 175 F.3d 985, 990 (Fed. Cir. 1999))). The question in the present case is closer than in *MBO Laboratories*, because the key disputed term in this case, “incorporated,” is an adjective but the term “incorporating” is a verb that refers to the process by which “incorporation” is accomplished. Wright points out that limitations that may describe structural characteristics, such as “incorporated,” are presumed to describe such characteristics when used in product claims. *See, e.g., 3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371–72 (Fed. Cir. 2003) (citations omitted). As explained below, Pelican’s argument that prosecution history requires limiting the claims with certain process elements fails to rebut this presumption, even if the word “incorporated” could bear the process limitations Pelican urges.

Wright also cites *Vanguard Products Corp. v. Parker Hannafin Corp.*, 234 F.3d 1370 (Fed. Cir. 2000), for the proposition that “arguments regarding process claims do not limit product claims when the examiner and applicant treat the claims differently.” (Docket Entry No. 36 at 8). In that case, the Federal Circuit rejected an argument that a claim for a type of gasket should be limited by a process step of “co-extrusion.” 234 F.3d at 1372. The court concluded that the prosecution history showed that “the examiner as well as the applicant treated the product claims as directed to the product itself, and examined the application accordingly.” *Id.* The inventor distinguished the invention from the prior art based on the product’s structural features, not on the process for making the product. *Vanguard* does support Wright’s argument that if the prosecution history separately

treats product and process claims, statements made in the context of one cannot be used as a basis to argue estoppel as to the other. *Vanguard*'s statement that "[t]he method of manufacture, even when cited as advantageous, does not itself convert product claims into claims limited to a particular process," 234 F.3d at 1372, also supports Wright's legal argument, although it is unclear that in *Vanguard*, the relationship between the process and product was as close as it appears to be in the present case. Because *Vanguard* contains little factual information on the patent's prosecution history, the case provides limited assistance.

Pelican argues that in response to the examiner's rejection, the inventor described the invention as a "process . . . and the products thereof." In response, Wright points out that this statement does not limit the product claims. Instead, the statement refers to the product-by-process claims that are included in the Patent. Claim 14, for example, claims "[a]n incorporated asphalt composition made by a process according to claim 1." '818 Patent col.6 ll.58–59. Both the examiner and the inventor specifically and separately addressed the reasons for rejecting the process claims and the product or composition claims. In rejecting the original application, the examiner criticized the "composition" of the product separately from the "process." In response to the rejection of the claim for the process for preparing an "incorporated asphalt composition," the inventor added a step of "abrasively absorbing the ground tire rubber into the distillation tower bottoms until the mixture is homogenized and a stable incorporated asphalt composition is formed." The amendment made clear that the process claim required a different step than combining by heating and melting. In response to the rejection of the product claim, the inventor did not change the words "incorporated asphalt composition," but did change the word "and" between "ground tire rubber" and "distillation tower bottoms" to "incorporated into." The inventor stated, "With respect to the product claims, none of the references cited provide a product which is 'incorporated' as

defined in the specification, page 4, lines 21–24, as an ‘asphalt composition in which the ground tire rubber is fully incorporated into the distillation tower bottoms.’ This clearly states the distillation tower bottoms is the carrier for the ground tire rubber.” (Joint Ex. 1A at 48).

Pelican focuses on the inventor’s statement to the examiner that if insufficient quantities of air were used in the process, the ground tire rubber would not be “properly incorporated” and would separate out. The claimed invention, distinguished over prior art, was the use of air under pressure with a specified range of heat. (Docket Entry No. 36 at 14). In response, Wright points out that this statement was made in response to the examiner’s rejection of the process claim, not the product claim, and that there is no textual support in the product claim to support importing a process limit.

The doctrine of claim differentiation supports Wright’s position that the product claims should not be construed to limit them to product-by-process claims. The claim differentiation doctrine is “based on the common-sense notion that different words or phrases used in separate claims are presumed to indicate that the claims have different meanings and scope. To the extent that the absence of such difference in meaning and scope would make a claim superfluous, the doctrine of claim differentiation states the presumption that the difference between claims is significant.” *Andersen*, 474 F.3d at 1369–70 (quoting *Karlin Tech. Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 971–72 (Fed. Cir. 1999); *Tandon Corp. v. U.S. Int’l Trade Comm’n*, 831 F.2d 1017, 1023 (Fed. Cir. 1987)) (internal quotation marks omitted); *see generally Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380–81 (Fed. Cir. 2006) (providing an overview of the doctrine).

The different claims at issue here are Claims 14 and 15 of the ’818 Patent, which are phrased as product-by-process claims, and Claims 11 to 13, which are phrased as product claims. Claims 14 and 15 read:

14. An incorporated asphalt composition made by a process according to claim **1**.

15. An incorporated asphalt composition made by a process according to claim **8**.

'818 Patent col. 6 ll. 58–61. Unlike Claims 11 to 13, Claims 14 and 15 explicitly limit the product to the process by which they are created. Wright argues that the contrast between the language of Claims 11 to 13 and Claims 14 and 15 suggests that Claims 11 to 13 are claims for products of certain specifications.

The doctrine of claim differentiation gives rise to a presumption that can be overcome. The *Andersen* court considered the presumption and rejected its application because the “powerful evidence” in favor of a contrary interpretation meant that “the written description and prosecution history overc[a]me any presumption arising from the doctrine of claim differentiation.” *Id.* (quoting *Kraft Foods, Inc. v. Int’l Trading Co.*, 203 F.3d 1362, 1368 (Fed. Cir. 2000)); see also *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1480 (Fed. Cir. 1998) (“[T]he doctrine of claim differentiation cannot broaden claims beyond their correct scope, determined in light of the specification and the prosecution history and any relevant extrinsic evidence. . . . [C]laims that are written in different words may ultimately cover substantially the same subject matter.”). As the *Andersen* court observed, “overlapping claims are not unusual.” *Id.*; see also *Sandoz*, 566 F.3d at 1289 (holding that the prosecution history compelled a restrictive reading of a claim even though the reading “arguably renders the remainder of that claim redundant”). The prosecution history here is not sufficient or sufficiently clear to compel the restrictive reading of “incorporated” in Claims 11 to 13 that Pelican urges.

The language of the claims and specification, and the prosecution history, lead this court to construe the term “incorporated” in Claims 11 to 13 consistent with the text that make them product

claims rather than process or product-by-process claims. Both the claim language and the specification make it clear that adding “incorporated into” as part of Claim 11 did not import all the process limitations. Instead, “incorporated asphalt composition” describes the physical characteristics and structural limits of the composition. The inventor’s remarks submitted with the amendments to the initially rejected application do not compel a different result because the remarks Pelican is using to support this argument were directed to process claims, not to the product claims of Claims 11 to 13. Pelican’s use of prosecution history requires clear and unequivocal statements in the prosecution history that are consistent with the patent specifications. *See, e.g., Southwall Techs.*, 54 F.3d at 1576; *Andersen Corp.*, 474 F.3d 1371. In this case, the prosecution history and specifications are consistent with Wright’s position that the product claims are not limited by the process that is separately claimed in the Patent.²

The word “incorporated” in the phrase “incorporated asphalt composition” means “homogenous and stable.” The word “incorporated” in the phrase “incorporated into” means “combined so as to be homogenous and stable.” The parties have agreed that “stable” means “a composition that does not separate into component parts in storage.”

2. “%”

The term “%” appears in the same context in Claims 11 and 12 of the ’818 Patent. The first claims “[a]n incorporated asphalt composition consisting essentially of about 1–27 % ground tire rubber incorporated into about 73–99 % distillation tire bottoms.” ’818 Patent, col.6 ll.48–50. The second claims “[a]n incorporated asphalt composition consisting essentially of about 12–25 %

² Rockey’s testimony that the claims should be understood to include process limitations does not lead to a different result. Rockey’s testimony focused almost exclusively on how he, as a person experienced in the PTO’s operations, would interpret the claims based on the intrinsic evidence. He did not purport to have technical expertise that would qualify him to testify as to how a person having ordinary skill in the art would understand the patent materials. Reaching legal conclusions based on the intrinsic and extrinsic evidence is the court’s role.

ground tire rubber incorporated into about 75–88 % distillation tire bottoms.” *Id.*, col.6 ll.48–50. Wright argues that “%” means “percent by weight of the final product.” Pelican argues that “%” could refer either to percent by weight or percent by volume and that it is also unclear whether the percentages in the three claims refer to the percent of the total composition or the percent of the ground tire rubber relative to the distilled tower bottoms.

At the *Markman* hearing, Pelican’s expert witness, Dr. Amirkhanian, explained that the difference is important because the components have different specific gravities — that is, they do not weigh the same per unit of volume. Because of this difference, measuring by percentage of weight would yield a different ratio of components than measuring by percentage of volume. (*See* Docket Entry No. 52 at 19–25). Dr. Amirkhanian further testified that “it would have been very, very easy just to define what it would have been either by weight, volume, by percent asphalt or not.” (*Id.* at 17). As explained below, however, Wright’s expert, Dr. King, provided a credible and persuasive account of how a binder formulator would understand “%” that is consistent with the intrinsic evidence.

Dr. Amirkhanian and Dr. King agreed that the person having ordinary skill in the art is a binder formulator, not a binder technician. (Docket Entry Nos. 50; 52 at 29). A binder formulator mixes asphalt blends to meet specific performance requirements. (Docket Entry No. 50 at 24). The parties’ expert witnesses disagreed about the educational qualifications of a formulator. Dr. King testified that a person having ordinary skill in the art would possess at least a bachelor’s degree; Dr. Amirkhanian testified that a high school or associate’s degree would suffice. (Joint Ex. 4A at 8; Docket Entry No. 52 at 28–29). This difference does not appear significant. Dr. King testified before Dr. Amirkhanian, and his understanding of Dr. Amirkhanian’s opinion was based on a undefined “several years” of experience, which Dr. King characterized as typical of a binder

technician. (Docket Entry No. 50 at 32). In his testimony, Dr. Amirkhanian testified that at least seven to ten years of experience under a skilled binder formulator, such as Dr. King, could compensate for less education. (Docket Entry No. 52 at 15–16). Dr. Amirkhanian downplayed the difference between their definitions, testifying that Dr. King had said “what I pretty much said, too.” (*Id.* at 30). The experts disagreed more about the education required to be a binder formulator than about the knowledge and experience. Most relevant to the analysis here, they agreed that approximately a decade of experience working in a binder lab under a skilled binder formulator would be necessary to become a binder formulator. Wright’s expert witness, Dr. King, is an experienced binder formulator. Dr. Amirkhanian, Pelican’s expert witness, did not testify that he had experience working in a binder laboratory.

The intrinsic evidence shows that measurements should be in terms of weight. The specification gives every example in terms of weight, not volume. The examples all use grams for laboratory formulations and pounds or tons for plant formulations. *See* ’818 Patent col.3 ll.52–55 (“In laboratory size equipment, 807.5 g DTB is heated to 350° F., 42.5 g GTR is added to the DTB and stirred for one minute until all the dry GTR is incorporated into the DTB.”); *id.* col.4 ll.22–24 (“2550 g DTB is heated to 350° F. 850 g GTR is added to the DTB and stirred for 2 minutes until the GTR is completely wetted and incorporated into the DTB.”); *id.* col.4 ll.55–56 (“70.4 tons DTB is heated to 350° F. 9.6 tons GTR is added to the DTB through a wetting vessel.”). The examples give two percentages for each mixture, one for ground tire rubber and one for distillation tower bottoms. *Id.* col.10 ll.48–54.

Dr. King testified at the *Markman* hearing that “[o]n the binder side of the laboratory, we’re weighing everything. All formulations are transmitted to the plant by weight.” (Docket Entry No. 50 at 34). His examination continued:

Q. Okay. Now, with respect to the binder lab, in general, in the work that's done, is there any confusion between weight and volume?

A. No. In the context of the patents and reading a patent or formulations, everything would always be by weight.

(*Id.* at 35). Pelican's expert witness, Dr. Amirkhanian, did not dispute that binder laboratories use weight, not volume, in their measurements. He also conceded that the intrinsic evidence suggested that measurement by weight, not volume, was appropriate, though he asserted that the intrinsic evidence was "not sufficient." (Docket Entry No. 52 at 36–37). He did not explain why.

This court concludes that a person having ordinary skill in the art would understand "%" to refer to weight, not volume. Dr. King's testimony that binder laboratories measure by weight, not volume, explains why the quantities listed in the specification are in weights. Dr. King's uncontroverted testimony that binder formulators measure by weight and the specification's use of weights to denote quantity and show that a person having ordinary skill in the art would understand "%" to mean percent by weight, not volume.

Dr. King also credibly explained why a person having ordinary skill in the art would understand "%" to refer to percent by weight of the final composition, not percent of the asphalt binder:

Q. Dr. Amirkhanian also asserts in his report that to the extent a percentage number is assigned to the ground tire rubber for use in a specification and in the patent, that it's unclear as to whether or not the percentage that is assigned to the ground tire rubber is a percentage of the distilled tire bottoms that it is going to be mixed with or a percentage of the final product that is the binder.

Do you agree or disagree with that assertion?

A. He's absolutely right that there are two ways we can define things. We can proportion everything so that we look at the total weight and then each component is a percentage of the total; or we can base everything on as — all additives on asphalt weight where

asphalt is 100 percent and then every additive we put in might be a percentage of that asphalt weight. But in the case of all the claims here, clearly asphalt is something less than 100 percent. The only possible that could be is if the components in total add to 100 percent. So, it is very clearly a percent of the total weight for each component.

(Docket Entry No. 50 at 36–37). Dr. King explained, by way of example, that in Claim 11, the percentage ranges of the components — “1–27% ground tire rubber incorporated into about 73–99% distillation tower bottoms,” ’818 Patent col.6 ll.49–50 — add to 100 percent. The weights are a percentage of the “total weight of the composition.” (Docket Entry No. 50 at 37). This court agrees that this is the most reasonable interpretation of the claim language.

Even if Pelican is correct that this construction is not mandated by the claim language and the specification, Pelican’s alternative is to say that the claim term is so indefinite as to be incapable of construction, supporting its invalidity contention. When there is a reasonable construction of the claim language that prevents invalidity, a court must adopt it rather than declare the patent invalid. *See Phillips*, 415 F.3d at 1327–28 (noting that the source of the rule is the “presum[ption] that the Commissioner did his duty” when granting the application (quoting *Klein v. Russell*, 86 U.S. 433, 466 (1873))). Wright has offered such a construction and supported it by credible evidence. This court construes “%” to mean “percent by weight of the final product.”

The term “%” means “percent by weight of the final product.” This same definition is used in the ’561 Patent.

3. “synthetic rubber”

The final disputed term in the ’818 Patent is “synthetic rubber.” Pelican argues that the term should mean “rubber manufactured from petroleum and other chemicals rather than the product of raw rubber extracted from rubber vegetation.” Wright argues that this definition is too restrictive, because a person having ordinary skill in the art would understand that synthetic rubber may include

some natural rubber. Both parties relied on extrinsic evidence. The testimony of Wright's expert witness, Dr. King, was as follows:

Q. [Pelican] also define[s] "synthetic rubber." What is your opinion with respect to their definition of "synthetic rubber"?

A. Synthetic rubber, if you go to the dictionary, has a very clear definition and would logically seem to be very clear. But it becomes very confusing because here we are talking about ground tire rubber; and that means we are taking tires, grinding them and putting in asphalt.

Typically, natural rubber comes — polymer comes from a rubber plant; and, therefore, it is natural because it grew in nature. A polymer that is manufactured by man, such as styrene-butadiene polymer, because it is manufactured, we call synthetic. The difficulty is that polyisoprene, the polymer that comes from rubber trees, can also be manmade.

When we make a rubber tire for trucks, we usually use polyisoprene — polyisoprene, but it might be manmade. It might come from the rubber tree. We don't know. It makes the same tire. It is the same product, chemically. And, therefore, when we buy a truck tire, we buy what we call ground tire rubber that is natural rubber. Well, it is compounded rubber that has blends of many things. We have no idea whether it was natural or synthetic in the sense — or in the context of the definition as presented in this case. . . .

Q. So, some synthetic rubbers do contain an element of natural rubber?

A. When we are buying tires, car tires are mostly synthetic. Rubber tires are mostly natural, but it is not definitive.

Q. So, when they define "synthetic rubber" to the — that it necessarily has to be — particularly in reference to tire rubber — to the total exclusion of natural rubber, do you agree or disagree with that?

A. It would not be to the exclusion of the other.

(Docket Entry No. 50 at 55–56).

Dr. King’s testimony initially appears to suggest that the dictionary definition does not match the meaning that one having ordinary skill in the art would assign to the term. But this is not a case in which the evidence of the meaning in the art and the dictionary definition conflict. *Cf. Phillips*, 415 F.3d at 1322 (noting that “‘a general-usage dictionary cannot overcome art-specific evidence of the meaning’ of a claim term” (quoting *Vanderlande Indus. Nederland BV v. Int’l Trade Comm’n*, 336 F.3d 1311, 1321 (Fed. Cir. 2004))). Dr. King consistently used “synthetic” and “natural” in opposition. This mirrors the relevant dictionary definition of synthetic: “produced artificially or manmade,” as opposed to occurring naturally. WEBSTER’S NINTH NEW COLLEGIATE DICTIONARY 1198 (1990). Dr. King appears to have conflated the term “synthetic rubber tires,” which does not appear in the claims, and “synthetic rubber,” the disputed term. In an affidavit, he offered the following opinion: “Synthetic rubber tires may contain some natural rubber.” The language of Claim 13, the only claim to use the term “synthetic rubber,” is consistent with this statement. It reads, “An incorporated asphalt composition according to claim **11** wherein the ground tire rubber includes synthetic rubber.” ’818 Patent col.6 ll. 55–57. A tire containing, as in Dr. King’s example, a mix of synthetic and natural rubber “includes synthetic rubber.”

The term “synthetic rubber” means “rubber manufactured from petroleum and other chemicals rather than the product of raw rubber extracted from rubber vegetation.” This definition is the same in the ’561 Patent.

B. The ’561 Patent

The ’561 Patent has scant prosecution history. It claims a different process than the ’818 Patent for incorporating tire rubber particles into asphalt, a process that does not use oxidation (as

the '818 Patent did) or additives (as prior art disclosed). The parties dispute twelve terms³ in Claims 1–2 and 4–8 of the '561 Patent: “fully incorporated,” “asphalt medium,” “a middle portion,” “a bottom portion,” “jet spray nozzles,” “completely integrated,” “%,” “mixing,” “synthetic rubber,” “blending,” “polymer material,” and “holding vessel.” Each is analyzed below.

1. “fully incorporated” and “completely integrated”

Pelican gives the terms “fully incorporated” and “completely integrated” different meanings. Pelican defines “fully incorporated” as “the complete, stable incorporation of whole tire rubber granules into the asphalt medium without oxidation or air-blowing, using only the specific mixing method of the claim.” Pelican defines “completely integrated” as “the absorption of the whole tire rubber granules into the asphalt medium in the reactor between about 485° F. and about 510° F., provid[ing] a smooth product, whereby particles of rubber cannot be seen in the finished product even when viewed under a microscope.” Wright argues that the terms are “used synonymously . . . to describe a product that is homogenous and stable.” (Docket Entry No. 34 at 20). Wright notes that the Federal Circuit has recognized that inventors may use different terms to describe similar concepts. *Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1120 (Fed. Cir. 2004); *Curtiss-Wright*, 438 F.3d at 1380–81; *Banco Corp. Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1373 (Fed. Cir. 2004). Wright faults Pelican’s construction of “fully incorporated” for excluding steps in a claim that uses the word “comprising.” *See Dow Chem. Co. v. Sumimoto Chem. Co.*, 257 F.3d 1364, 1380 (Fed. Cir. 2001). Wright also faults Pelican’s proposed construction of “completely integrated” on the basis that it makes Claim 1’s scope narrower than

³ The parties initially disputed the meaning of “stable” and “heat exchanger” but agreed to the meaning before the hearing. (Joint Ex. 7 at 5). As used in the '561 Patent, “stable” means “a composition that does not separate into component parts in storage” and “heat exchanger” means “a device for heating an asphalt medium.”

its dependent claims, Claims 2 and 3. *See AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1242 (Fed. Cir. 2003) (“Under the doctrine of claim differentiation, dependent claims are presumed to be of narrower scope than the independent claims from which they depend.” (citations omitted)).

Pelican relies heavily on the structure of Claim 1, which is repeated for convenience:

1. A process for preparing a fully incorporated asphalt composition comprising:

introducing asphalt medium into a reactor vessel; introducing whole tire rubber granules into the asphalt medium to form a mixture of the asphalt medium and the whole tire rubber granules;

circulating part of the mixture from a middle portion of the reactor vessel into a bottom portion of the reactor vessel through jet spray nozzles until the whole tire rubber granules are completely integrated into the asphalt medium; and

forming a stable, fully incorporated asphalt composition.

'561 Patent col.9 ll. 7–19.

Pelican notes that “the phrase ‘completely integrated’ is used in the body of the claim to describe the result of the specific third step in the process of ‘circulating’ part of the mixture. It is not until the required fourth step in the process is completed that the resulting ‘fully incorporated’ composition is formed.” (Docket Entry No. 36 at 23 (emphasis in original)). Pelican rejects Wright’s contention that this construction of “completely integrated” makes the primary claim narrower than the dependent claims. According to Wright, “Pelican’s construction adds the mandatory teaching of using a specific circulation temperature range of 485° F.–490° F. and –510° F., whereas claim 2 calls for the circulation temperature to be narrower, i.e. ‘about 500° F.’ Claim 3 only restricts the process by specifying a percentage range for the rubber/asphalt mixture additives.” (Docket Entry No. 36 at 24). Pelican argues that its definition of “‘fully incorporated’

is completely consistent with, and supported by, the preceding specific recitals in claim 1.” (*Id.*). Pelican asserts that the exclusion of air blowing and oxidation is “consistent with the entire objectives recited repeatedly throughout the patent specification. The use of these terms in the construction of this phrase in no way limits the claim beyond what the specification specifically recites to distinguish the invention over the prior art processes, including the ’818 Patent itself.” (*Id.*).

The terms “fully incorporated” and completely integrated” are synonyms.⁴ “Different claims with different words can, of course, define different subject matter within the ambit of the invention. On the other hand, claim drafters can also use different terms to define the exact same subject matter.” *Curtiss-Wright*, 438 F.3d at 1380 (citations omitted). Whether the claim language is properly construed to apply to similar concepts depends on the context. *Innova/Pure Water*, 381 F.3d at 1120. Pelican argues that the inventor’s drafting decision to place “circulating the mixture . . . until the whole tire rubber granules are *completely integrated* into the asphalt medium” before the semicolon and to place “forming a stable, *fully incorporated* asphalt composition” after the semicolon in Claim 1 creates two discrete steps, so the terms must have different meanings. But neither the punctuation nor the words support this result. Although the word “forming” could describe a separate and discrete step, it could also describe the result of a process, as in, “beat the egg whites, incorporating as much air as possible and forming stiff peaks.” The abstract to the ’561 Patent supports the less restrictive interpretation. The abstract describes the claimed process as

⁴ The terms “fully incorporated” and “completely integrated” in Claim 1 of the ’561 Patent have the same meaning as “incorporated” in the ’818 Patent. This is consistent with the ’561 Patent’s abstract, which refers to the product as an “incorporated asphalt composition.” The ’818 Patent’s abstract describes the product as “completely incorporated.” See also ’818 Patent col.2 ll.1–3 (“The two components are combined into a new composite which is completely incorporated together and is stable.”); *id.* col.3 ll.29–30 (“the finished product, which is completely incorporated”). The inventor used these similar terms interchangeably in the two patents.

involving “circulating . . . until the whole tire rubber is completely integrated into the asphalt medium and a stable, homogeneous asphalt composition is formed.” ’561 Patent, Abstract; *see also iLor, LLC v. Google, Inc.*, — F.3d —, 2011 WL 140358, at *6 (Fed. Cir. 2011) (relying on the abstract to interpret a claim term); *Edward Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1328 (Fed. Cir. 2009) (same); *Nartron Corp. v. Schurka U.S.A. Inc.*, 558 F.3d 1352, 1357 (Fed. Cir. 2009) (same). None of the descriptions of the preferred embodiments or any other description of the process suggests the more restrictive definition.

Pelican is correct that the process by which the final product becomes “fully incorporated” or “completely integrated” does not include oxidation or air-blowing. Claim 1 of the ’561 Patent describes the process as using jet nozzles to integrate the tire rubber granules into the asphalt medium. The ’561 Patent distinguishes the invention from the prior art based on the lack of oxidation and air blowing. ’561 Patent col.2 ll.20–22 (“None of these prior art disclosures describe a process for incorporating whole tire rubber into an asphalt medium, without oxidation or air blowing, as described below.”). The specification notes that “[i]t is an object of the invention to provide a process for incorporating whole tire rubber into an asphalt medium without oxidation or air blowing.” *Id.* col.2 ll.47–49. The specification identifies the absence of air blowing and oxidation as an advantage of the invention. *Id.* col.4 ll.30–34 (“Advantages of the claimed process include . . . fully incorporating the whole tire rubber into the asphalt medium while the finished product is still ‘virgin’, i.e. non-oxidized or air blown.”). Although Wright is correct that Claim 1’s use of the word “comprising” does not exclude additional steps, *see Dow Chem. Co.*, 257 F.3d at 1380, the disavowals of air blowing and oxidation in the specification exclude those steps from the claims. *See Honeywell Int’l*, 452 F.3d at 1318 (limiting an invention to a fuel filter when the specification referred to the filter as “the invention” four times in the specification and the

specification lacked any reference to an invention other than the fuel filter); *SciMed Life Sys.*, 242 F.3d at 1341 (“Where the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question.”).

The terms “completely integrated” and “fully incorporated” in the ’561 Patent mean “combined so as to be homogenous and stable.”

2. “asphalt medium”

Wright argues that “asphalt medium” means asphalt, regardless of its derivation. The parties have agreed that “asphalt” means “a dark bituminous substance that is found in natural beds and is also obtained as a residue in petroleum refining and that consists chiefly of hydrocarbons.” Pelican argues that “asphalt medium” means “the bituminous residue from petroleum distillation.” Pelican did not brief the term. At the *Markman* hearing, Pelican’s attorney argued that “asphalt medium” had to be distinguished from “asphalt,” which the inventor also used in the specification.

Pelican’s proposed construction is unnecessarily restrictive. One definition of “medium” is “a surrounding or enveloping substance.” WEBSTER’S NINTH, *supra*, at 738. This is consistent with understanding “asphalt medium” to mean the substance into which the ground tire rubber may be incorporated. The specification states that “[t]he process is not dependent on the type of asphalt medium used.” ’561 Patent col.2 ll.30–31. The specification does not mention petroleum distillation, and the only reference to distillation tower bottoms is in the ’818 Patent. *Id.* col.1 ll.23–24.

The term “asphalt medium” means “asphalt of any type into which a substance may be added.”

3. “a bottom portion” and “a middle portion”

Pelican argues that “a middle portion” in Claim 1 should be defined as “that part of the interior of the reactor vessel intersecting a line whereby one-half of the total available volume of the vessel is on one side of the line and one-half of the total available volume of the vessel is on the other side of the line” and that “a bottom portion” should mean “the area surrounding the lower interior face of the reactor vessel.” (Joint Ex. 7 at 6–7). Pelican argues that these terms must be narrowed because “[w]ithout some type of construction, they result in claim 1 and the depending claims not satisfying the requirements for definiteness as required by 35 U.S.C. § 112, thus making these claims invalid. . . . These are terms that must be defined by reference to some fixed physical parameters, so that the public can tell precisely whether a given process falls within, or outside of, the metes and bounds of this claim limitation.” (Docket Entry No. 36 at 24). Wright argues that the terms are clear and require no further definition.

“The requirement of claim definiteness is set forth in 35 U.S.C. § 112, ¶ 2, which requires claims ‘particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.’” *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1371 (Fed. Cir. 2008) (quoting 35 U.S.C. § 112, ¶ 2). “Because the claims perform the fundamental function of delineating the scope of the invention, the purpose of the definiteness requirement is to ensure that the claims delineate the scope of the invention using language that adequately notifies the public of the patentee’s right to exclude.” *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (citing *Chimie*, 402 F.3d at 1379); *see also United Carbon Co. v. Binney & Smith Co.*, 317 U.S. 228, 236 (1942) (“The statutory requirement of particularity and distinctness in claims is met only when they clearly distinguish what is claimed from what went before in the art and clearly circumscribe what is foreclosed from future enterprise”). The question is “whether

one of ordinary skill in the art would understand what is claimed when the claim is read in light of the specification.” *Seattle Box. Co.*, 731 F.3d at 826; *see also Datamize*, 417 F.3d at 1351. “Only claims not amenable to construction or insolubly ambiguous are indefinite.” *Datamize*, 417 F.3d at 1347 (citations and quotations omitted).

Read in light of the specification and in light of Dr. King’s uncontroverted testimony, the terms “a middle portion” and “a bottom portion” do not require the strict definition Pelican urges, because a broader definition is unnecessary for one having ordinary skill in the art to understand what is claimed. The intrinsic and extrinsic evidence show that the terms are relative terms, denoting the relationship of one portion to another, not an absolute position within the reactor vessel.

The claims themselves use the indefinite article “a,” not the definite article “the,” suggesting less precision about the locations. Nowhere does the specification suggest that a middle portion must encompass the precise line bisecting the vessel. Instead, the claims emphasize that the vessel structure and related components must be able to create sufficient turbulence within the vessel by churning the contents around the reactor vessel through the jet spray nozzles. *See* ’561 Patent col.4 ll.15–23 (“Thus, when the mixture is pulled from about the middle of reactor vessel **12** for circulation through pipeline **16** and pump **18**, the mixture circulated tends to be less incorporated than the mixture at the top of the reactor vessel, and during recirculation of this less incorporated mixture, is recirculated and the tire rubber granules are further softened in the turbulent environment and integrated into the asphalt medium until the samples obtained show a completely incorporated product.”).

The specification’s limited explanation that the “turbulence created allows the mixture to move upwardly through the reactor vessel,” but without any upward boundary, further supports this

construction of “a middle portion” and “a bottom portion.” (*Id.* col. 5:13–15.) The specification contains two figures depicting the apparatus used to combine the component parts of the product. The specification explains that the ingredients must be churned between the middle and bottom of the reactor vessel and that the upper portion or top of the reactor vessel is a space for exhaust with a pipe at the top. ’561 Patent col.3 ll.19–col.4 ll.23.

The testimony of Wright’s expert witness, Dr. King, who was the only witness to testify about the terms’ meaning, further demonstrated that the less precise, relative definitions indicate to one with ordinary skill in the art what is and is not claimed. His testimony was consistent with the intrinsic evidence. Pelican’s attorney asked Dr. King to draw “a middle portion” and “a bottom portion” of a tank on a piece of paper during the hearing. Before drawing, Dr. King explained, “Quite honestly, the only important thing is one nozzle below the other; and the top one would be below the surface. So, from an engineering point of view, I wouldn’t care beyond that how I located those two things, so long as they were apart — one was above the other, and both were below the surface of the liquid.” (Docket Entry No. 50 at 116). Dr. King further explained that “a middle portion” would be “[s]omething sufficiently below the surface so that when there’s agitation and flow, it’s not affecting the surface too much. So, something perhaps from here down to here; and then the bottom would be something in perhaps the bottom third of the tank.” (*Id.* at 117; *see also id.* at 118 (“I think the middle portion of the tank would indicate something far enough below the surface of the liquid such that any nozzles or spraying or if there’s any action, the action would not be pushing liquid up into the air above that liquid surface.”)). Dr. King then drew two dotted lines to represent the middle portion. The lines set out the middle portion as approximately the middle third of the tank. (Joint Ex. 26.) Pelican’s attorney questioned Dr. King about the drawing:

Q. All right. Now, you've drawn on there a dotted line. Okay? Now, that represents the top of the middle portion — of a middle portion?

A. It would be approximately. There is nothing definitive here without knowing what the power of the nozzles is and what the total tank layout is. You are asking me to try to guess how a chemical engineer might set up this process.

Q. No, sir, I am not.

A. From the patent.

Q. I'm just asking you, based upon the teaching in the patent and your understanding of that phrase and your expertise in this and your expert report, to draw on this drawing in the reactor vessel 12 where a middle portion would be. And you've drawn that, correct?

A. I'm making a best guess.

Q. A best guess. And you have to guess, don't you, because the inventor doesn't tell us where a middle portion begins and ends, correct?

A. Any engineer could read that — a chemical engineer could read that patent and make a judgment as to how to set up this process.

Q. I asked you if the inventor told us?

A. The inventor — this process is a chemical engineering skill — would require chemical engineering skills, not chemical skills, to design this tank. I believe the patent discloses enough that a chemical engineer skilled in the art could design this tank from what is said. I, as a chemist, cannot. That's not my skill.

(Docket Entry No. 50 at 119–20).

A similar exchange took place when Pelican's attorney asked Dr. King to draw "a bottom portion":

A. It would probably be the portion below the middle, but if you locate it — there has to be an inlet, outlet. They need to be far apart. So, if you located a pipe at the top or the bottom, you would not locate it immediately above that at the middle. There would have to

be some difference. It is more important to establish a distance between the inlet and outlet, rather than defining top and bottom, middle of the tank.

Q. Okay. That's not what the inventor did, did he? He said a middle portion and a bottom portion; and that's in the claim, correct?

A. I think an engineer could judge either way it was defined, how it might be. That was his choice. I think it is clear he made the point they have to be separated.

Q. They have to be separated?

A. The inlet and outlet have to be separated. They can't come in at the same place in the tank.

(*Id.* at 122–23). Later, Dr. King made clear that the relationship between the two regions need not be precise:

A. As long as there was sufficient difference between the two, then the bottom pipe could actually come in in the middle of the tank, if the other were near the top. In terms of it creating enough sheer and circulation to make the product, the exact location of those is not relevant. There is a large margin for error in how much they can move up and down.

Q. You are saying that the recital of a middle portion and a bottom portion in claim 1 of the '561 patent is irrelevant?

A. It is not irrelevant; and an engineer could determine from that description that one pipe had to be below the other by a significant difference, probably at least one third of the tank difference in height. But it doesn't have to be exactly at the middle and exactly at the bottom.

(*Id.* at 123–24).

Pelican's expert witness did not dispute Dr. King's testimony. During argument, Pelican's attorney emphasized his view of the importance of the details of Dr. King's drawing:

[W]hen I got him to . . . draw on the drawing of the '561 patent, you know what? He drew it through for the middle portion, he drew it

right through a line intersecting the middle of this; and that's what we tried to do in our construction of this.

So I think Dr. King's drawings, you've heard of a picture being worth more than words. In this case a picture speaks aons about a middle portion. And he also testified that and drew it that the bottom portion at least includes the bottom upper plate and side of the reactor vessel. That's the bottom of it.

(*Id.* at 80–81).

Dr. King's testimony demonstrates that the terms are not indefinite. *See, e.g., Spansion, Inc. v. Int'l Trade Comm'n*, 629 F.3d 1331, 1334–45 (Fed. Cir. 2010) (relying on expert testimony to determine that a claim was sufficiently definite). Dr. King credibly testified that a person having ordinary skill in the art for the purpose of designing the equipment to practice the patent would be a chemical engineer. Pelican has not disputed that aspect of Dr. King's testimony. Although Dr. King is a chemist, not a chemical engineer, he testified as to how a chemical engineer would understand the patent and the disputed term. *See, e.g., Southwall Techs.*, 54 F.3d at 1577–78 (holding that expert testimony did not establish ordinary meaning because experts gave their personal opinions about the term's significance, not an opinion as to how one skilled in the art would interpret the term) (citing *Becton Dickinson & Co. v. C.R. Bard, Inc.*, 922 F.2d 792, 797 (Fed. Cir. 1990)). Dr. King credibly testified that a chemical engineer would understand “a middle portion” to indicate the area within the reactor vessel above “a bottom portion,” such that nozzles would provide sufficient shear to mix the vessel contents.⁵ Although Pelican is correct that Dr. King's drawing of “a middle portion,” did, as Pelican's definition proposes, intersect the precise middle of

⁵ At the *Markman* hearing, Dr. King conceded that he had incorrectly substituted “the” for “a” in his expert report. The error does not detract from his knowledge of the relevant art or from the credibility of his testimony.

the reactor vessel, his uncontroverted testimony makes it clear that a chemical engineer would not understand the term so restrictively.

Having determined that a person having ordinary skill in the art would be able to understand “a middle portion” and “a bottom person,” it is inappropriate to constrain the terms’ meaning further out of validity concerns. As the Federal Circuit has explained:

A claim that is interpreted too broadly will run into validity issues, providing motivation for the construing court to choose a narrower interpretation if possible. However, validity construction should be used as a last resort, not a first principle: “we have limited the maxim [that claims are to be construed to preserve validity] to cases in which the court concludes, after applying all the available tools of claim construction, that the claim is still ambiguous.”

MBO Labs., 474 F.3d at 1332 (quoting *Phillips*, 415 F.3d at 1327 (internal quotation marks omitted)); see also *Generation II Orthotics Inc. v. Med. Tech. Inc.*, 263 F.3d 1356, 1365 (Fed. Cir. 2001) (“[C]laims can only be construed to preserve their validity where the proposed claim construction is ‘practicable,’ is based on sound claim construction principles, and does not revise or ignore the explicit language of the claims.”); *Elektro Instrument S.A. v. O.U.R. Scientific Int’l, Inc.*, 214 F.3d 1302, 1309 (Fed. Cir. 2000) (“[H]aving concluded that the amended claim is susceptible of only one reasonable construction, we cannot construe the claim differently from its plain meaning in order to preserve its validity”); *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1434 (Fed. Cir. 1988) (rejecting argument that limitations should be added to claims to preserve the validity of the claims). Because a more expansive definition of the terms “a middle portion” and “a bottom portion” makes the terms sufficiently definite, definiteness concerns do not provide a justification for narrowing them.

The term “a bottom portion” means “an area below a middle portion.” The term “a middle portion” means “an area above a bottom portion such that the jet spray nozzles provide sufficient shear to mix the contents.”

4. “jet spray nozzles”

Wright proposes defining “jet spray nozzles” as “apertures capable of providing a propulsion flow.” Pelican urges a more elaborate definition: “a plurality of devices, each having a body, an elongated nozzle tube extending from the body, such that the nozzles provide a propulsion spray of the liquid mixture within the body of the liquid mixture in the reactor vessel which: (1) promotes turbulence; (2) increases pressure; (3) simulates a boiling action in the liquid mixture; and (4) allows the mixture to move upwardly through the reactor vessel, without oxidation or air blowing.” (Joint Ex. 7 at 7–8.) Pelican notes that all these characteristics appear in the specification. Wright acknowledges that these characteristics are mentioned in the specification but argues that using the characteristics to limit the definition of the “jet spray nozzles” would improperly use the specification to limit the claim language to the scope of a preferred embodiment.

The language of the claims illustrates the properties the nozzle must possess. Each claim in the ‘561 Patent involves “circulating part of the mixture from a middle portion of the reactor vessel into a bottom portion of the reactor vessel through jet spray nozzles until the whole tire rubber granules are completely integrated into the asphalt medium.” ’561 Patent col. 9 ll13–17; *see also id.* col. 10:19–25 (“circulating part of the mixture . . . from a middle portion of the reactor vessel into a bottom portion of the reactor vessel through . . . jet spray nozzles . . . until the whole tire rubber granules are completely integrated into the asphalt medium). There is no indication that anything other than the nozzles provides for this circulation, and this point is reinforced by the ordinary meaning of “nozzle” as an object, as King testified. The “jet spray nozzles” must be capable of

accomplishing this function. *See Phillips*, 415 F.3d at 1324 (using the claim language to impose requirements on a term used in the claim).

Dr. King acknowledged during the *Markman* hearing that most engineers would understand “nozzle” to suggest a body. (Docket Entry No. 50 at 105–06 (“It’s hard for me to tie a hole to a nozzle. I think the body more likely is required to change the definition from an aperture to a nozzle. I think most engineers would accept that there had to be a body.”)). This is consistent with the standard dictionary definition of a nozzle as “a short tube with a taper or constriction used (as on a hose) to speed up or direct flow of a fluid.” WEBSTER’S NINTH, *supra*, at 809. King repeatedly testified that, from the perspective of one skilled in the art, the primary concern would be the ability of the nozzle to cause to propel the substance passing through it. Pelican offered no testimony or other evidence to dispute this contention.

Pelican’s proposed definition is more detailed and uses terms found in the specification. Wright’s position is that Pelican’s definition is unnecessary at best, and, at worst, improperly reads restrictions into the claim terms from the specification. The Federal Circuit has acknowledged that “the distinction between using the specification to interpret the meaning of a claim and importing limitations from the specification into the claim can be a difficult one to apply in practice.” *Id.* at 1323 (citing *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186–87 (Fed. Cir. 1998)). The claims must be read in light of the specification, but limitations must not be improperly imported from the specification into the claims. *Id.*; *see also SciMed Life Sys.*, 242 F.3d at 1340 (describing “reading a limitation from the written description” as “one of the cardinal sins of patent law”). The purpose of the specification — to teach a person having ordinary skill in the art to practice the invention — provides a guide to distinguishing between the two. *Phillips*, 415 F.3d at 1323. “One of the best ways to teach a person of ordinary skill in the art how to make and use the

invention is to provide an example of how to practice the invention in a particular case.” *Id.* “Much of the time, upon reading the specification in that context, it will become clear whether the patentee is setting out specific examples of the invention to accomplish those goals, or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive.” *Id.* The line between improperly limiting the claims and appropriately defining claim terms depends on “the context of the particular patent.” *Id.* at 1323–24; *see also Wang Labs., Inc. v. Am. Online, Inc.*, 197 F.3d 1377, 1383 (Fed. Cir. 1999) (“Although precedent offers assorted quotations in support of differing conclusions concerning the scope of the specification, these cases must be viewed in the factual context in which they arose. Whether an invention is fairly claimed more broadly than the ‘preferred embodiment’ in the specification is a question specific to the content of the specification, the context in which the embodiment is described, the prosecution history, and if appropriate the prior art.”).

The present claim construction task does not require resolving this issue. Defining “jet spray nozzles” based on the ordinary meaning to a person having ordinary skill in the art and modified by the use of the term in the claims performs this court’s *Markman* work. As the Federal Circuit has emphasized, the district court is only required to resolve “fundamental” disputes over claim terms. *O2 Micro*, 521 F.3d at 1362; *see also U.S. Surgical Corp.*, 103 F.3d at 1568 (refusing, in an obviousness determination, to reverse a district court’s refusal to settle a dispute over instructions when “none of these rejected instructions was directed to, or has been shown reasonably to affect, the determination of obviousness” and noting that claim construction “is not an obligatory exercise in redundancy”). The purpose is to prevent the jury from interpreting claims, a legal question for the court, while leaving the fact question whether infringement exists to the jury. *O2 Micro*, 521 F.3d at 1360 (citing *Markman*, 52 F.3d at 976). Although Wright does not elaborate on its

infringement theory, there is no basis to conclude that failing to determine whether the elaborations to the definition of “jet spray nozzles” Pelican advocates are required will leave the jury to answer the legal question of the claims’ scope.⁶

The Federal Circuit has made clear that “district courts may engage in a rolling claim construction, in which the court revisits and alters its interpretation of the claim terms as its understanding of the technology evolves.” *Pressure Prods. Med. Supplies, Inc. v. Greatbatch Ltd.*, 599 F.3d 1308, 1316 (Fed. Cir. 2010) (quoting *Pfizer, Inc. v. Teva Pharm., USA, Inc.*, 429 F.3d 1364, 1377 (Fed. Cir. 2005)); *see also Sofamor Danek Grp., Inc. v. DePuy-Motech, Inc.*, 74 F.3d 1216, 1221 (Fed. Cir. 1996) (“*Markman* does not obligate the trial judge to conclusively interpret claims at an early stage in a case.”). As the case proceeds, it will become clearer whether the details Pelican advocates as part of the definition of “jet spray nozzles” will be significant. *See Pressure Prods. Med. Supplies*, 499 F.3d at 1316 (“[T]his court understands that a trial judge may learn more about the technology during the trial that necessitates some clarification of claim terms before the jury deliberates.”); *see also Jack Guttman, Inc. v. Kopykake Enters.*, 302 F.3d 1352, 1361 (Fed. Cir. 2002) (noting the difficulty of conducting claim construction “before significant discovery has occurred”). If it appears that this issue will be important, the parties should raise the issue as early as possible to avoid prejudice, preferably before or in conjunction with a motion for summary judgment. *See Utah Med. Prods., Inc. v. Graphic Controls Corp.*, 350 F.3d 1376, 1381–82 (Fed. Cir. 2003) (holding that the district court did not err in amending its claim construction during oral

⁶ To be clear, this court is not declining to interpret the term further to allow construction in light of the accused infringement. “It is well settled that claims may not be construed by reference to the accused device.” *NeoMagic Corp. v. Trident Microsys., Inc.*, 287 F.3d 1062, 1074 (Fed. Cir. 2002) (citing *SRI Int’l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1117 (Fed. Cir. 1985) (en banc)). Instead, a more developed theory of infringement will allow this court to determine whether additional construction of this claim term is necessary to prevent the jury from performing that function.

arguments for pretrial motions nearly two years after the original construction); *see also Pressure Prods. Med. Supplies*, 599 F.3d at 1315–16 (rejecting the appellant’s argument that the “trial judge’s late adjustment prejudiced its defense” when the “district court made the adjustment early enough in the trial to give [the appellant] an opportunity to consider the new construction and adjust its arguments to account for the change”).

At this point, based on the present record, this court construes the term “jet spray nozzles” to mean “objects or structure with an aperture capable of providing a propulsion spray of the material passing through it,” without including the additional elaborations proposed by Pelican.

5. “%”

The arguments about the term “%” in the ’561 Patent are generally the same as those in the ’818 Patent. Pelican notes that there are also references to volume in the ’561 Patent claims. *See, e.g.,* ’561 Patent col.7 ll.14–16. (“A plant run was carried out using a mixture of 127,000 pounds (15,000 gallons) of AC-5 asphalt medium together with 14,166 pounds of tire rubber particles (20 mesh).”). In light of Dr. King’s uncontroverted testimony that binder formulators measure quantities according to weight, not volume, the mere inclusion of volume alongside weight is not enough to suggest that the inventor sought to create his own definition that different from the ordinary meaning. This court concludes that the definition of “%” is the same for both patents.

The term “%” means “percent by weight of the incorporated asphalt composition.” The definition is the same as in the ’818 Patent.

6. “mixing”

The term “mixing” appears only in Claim 5, which states: “A process according to claim 1 comprising mixing in the reactor vessel for about 5 to 10 hours.” ’561 Patent col.10 ll.1–2. Pelican argues that this court should define the term “mixing” to mean “combine into one homogenous

product.” Wright argues that the term should be given its ordinary meaning of combining or blending together. *See WEBSTER’S NINTH, supra*, at 761.

Neither party has argued that the term “mixing” has a meaning to the person having ordinary skill in the art that differs from its ordinary dictionary definition. *See Phillips* 415 F.3d at 1314 (“In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges . . .”). The ordinary meaning of the term does not, however, require homogeneity, as Pelican urges. Something is “homogenous” if it has “a uniform structure or composition throughout.” *Id.* at 578. The dictionary lists several synonyms for “mix” that suggest varying levels of homogeneity. *See id.* at 761. “[U]nless compelled to do otherwise, a court will give a claim term the full range of its ordinary meaning as understood by an artisan of ordinary skill.” *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001) (citations omitted). Pelican has not explained why a narrower construction is required.

“Mixing” has its ordinary meaning of “combining” or “blending.”

7. “blending”

Pelican argues that “blending” should mean “to combine or mix so that the constituent parts are indistinguishable from one another.” Wright argues that the term requires no construction.

With one adjustment, Pelican’s proposed meaning is consistent with the ordinary meaning of the term. *See WEBSTER’S NINTH, supra*, at 159 (defining “blend” as “to combine or associate so that the separate constituents or line of demarcation cannot be distinguished”); *see also Phillips* 415 F.3d at 1314 (“In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges . . .”). “Blending” is “combining or mixing so thoroughly that the constituent parts cannot readily be distinguished from one another.”

8. “synthetic rubber”

Pelican proposes that “synthetic rubber” be construed to mean “a man-made elastomer of organic components.” This is a different definition than the one Pelican proposed for the same term in the ’818 Patent. Pelican has not explained the difference or what about the claim terms supports a different meaning for the same term in the ’818 Patent as opposed to the ’561 Patent. This court adopts the same definition for the term “synthetic rubber” for both Patents: “rubber manufactured from petroleum and other chemicals rather than the product of raw rubber extracted from rubber vegetation.”

9. “polymer material”

Wright argues that the term should be understood according to its ordinary meaning and requires no definition. Pelican argues that the term means “a naturally occurring or synthetic compound consisting of large molecules made up of a linked series of repeated monomers.” At the *Markman* hearing, Pelican’s attorney reviewed the elements of this term for Wright’s expert, who agreed that each element was part of the term’s ordinary meaning as understood by one skilled in the art. The exchange was as follows:

Q. Let me talk to you a little bit about polymer materials. Dr. King, you are familiar with monomers in general, aren’t you?

A. Yes, I am.

Q. Would you explain to the Court what a monomer is?

A. A monomer is some chemical molecule that’s fairly small that contains a double bond, and it would be — meant to be a precursor to make a polymer.

Q. Okay. Are monomers used to create polymers?

A. Yes.

Q. And, generally speaking, can’t polymers result in naturally occurring compounds such as natural rubber?

A. Ex — isoprene is the product of the natural rubber tree.

Q. So, your answer would be “yes”?

A. Yes.

Q. Okay. And can’t polymers, generally speaking, also be formed from synthetic compounds?

A. Very definitely.

Q. And aren’t polymers a series of links of repeated monomers?

A. Yes, they are.

Q. Okay. And aren’t polymers large molecules of monomers?

A. Yes, they are.

(Docket Entry No. 50 at 99–100). Wright has not identified any problem with the definition of this term for Claim 7 of the ’561 Patent. This court adopts Pelican’s proposed construction.

The term “polymer material” means “a naturally occurring or synthetic compound consisting of large molecules made up of a linked series of repeated monomers.”

10. “holding vessel”

Pelican argues that “holding vessel” means “a storage container other than the reactor vessel receiving the pumped asphalt composition.” The phrase “holding vessel” appears only in Claim 8, which claims a “process according to claim 1 further comprising pumping the formed asphalt composition into a holding vessel.” Claim 1 mentions a “reactor vessel,” in which the asphalt cement is mixed. “Into” ordinarily denotes going from one thing into another. Under the doctrine of claim differentiation, the use of different adjectives for the vessels is presumed to denote different vessels. *See Andersen*, 474 F.3d 1369–70. Use of the word “into,” which suggests moving the “formed asphalt composition” from one container “into” another. *See Kudlacek v. DBC, Inc.*, 25

F. App'x 837, 844 (Fed. Cir. 2001) (unpublished) (holding that “extending into” meant “extend[ing] from one space into another”; relying on the dictionary definition of “into” as indicating “entry, introduction, insertion, superposition, or inclusion” as in “came into the house” or “enter into an alliance”) (citing WEBSTER’S NINTH NEW COLLEGIATE DICTIONARY 634 (1985)) along with the different terms used to identify the two vessels, supports construing “holding vessel” to refer to a separate container than the “reactor vessel.” Because the claims mention only two vessels, the reactor vessel and the holding vessel, Pelican argues, the two vessels must be separate containers. This interpretation is consistent with, though not compelled on its own by, the figure in the specification. The doctrine of claim differentiation suggests that inventor’s decision to use different terms has some significance.

Wright responds that concluding that the reactor vessel and holding vessel must be different containers overlooks both claims’ use of the word “comprising.” “It is fundamental that the use of [‘comprising’] does not exclude additional unrecited . . . steps” *Sumimoto Chem. Co.*, 257 F.3d at 1380–81 (quoting *Vivid Tech. Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 811 (Fed. Cir. 1999)); see also *Smith & Nephew, Inc. v. Ethicon, Inc.*, 276 F.3d 1304, 1311 (Fed. Cir. 2001) (noting that “comprising” or some variant “appears in the vast majority of patent claims, for it implements the principle that claims are intended to provide a concise statement of the claimed invention as distinguished from what has gone before” and that “inventions may be practiced with steps in addition to those listed in the claims”). Wright contends that the asphalt mixture could be pumped out of the reactor vessel and back into the same container, which would be “pumping the formed asphalt composition into a holding vessel.” Under this reading, a single container may be a reactor vessel or a holding vessel, depending on what its purpose at the time. Wright points out that nowhere do the claims say the reactor vessel and the holding vessel must be different. Wright

contends that the labeling is merely purposive — that a container may be a reactor vessel when the reaction is taking place and a holding vessel when storing the composition.

Wright’s argument is consistent with the use of the words “comprising” and “into.” Although the preferred embodiment and figure in the specification illustrate the holding vessel and the reactor vessel as different containers, “patent coverage is not necessarily limited to inventions that look like the ones in the figures.” *MBO Labs.*, 474 F.3d 1323 (citing *Gart v. Logitech, Inc.*, 254 F.3d 1334, 1342 (Fed. Cir. 2001) (refusing to interpret “mounted on said body” to mean attached to the outside, even though all four figures illustrated the objects mounted on the exterior). As the *MBO Laboratories* court explained, “[l]imiting claims from the specification is generally not permitted absent a clear disclosure that the patentee intended the claims to be limited as shown. *Id.* (citing *Phillips*, 415 F.3d at 1323).

This court construes the term “holding vessel” in Claim 8 as “a vessel that receives the incorporated asphalt composition.”

IV. Conclusion and Order

This court has construed the disputed terms as follows:

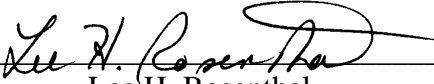
<p>Claims 11 to 13, '818 Patent</p> <p>“incorporated” asphalt composition</p> <p>“incorporated” into</p>	<p>“incorporated” means homogenous and stable.</p> <p>“incorporated into” means combined so as to be homogenous and stable.</p> <p>(The parties have agreed that “stable” means “a composition that does not separate into component parts in storage.”)</p>
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Claims 11 and 12, '818 Patent; Claim 4, '561 Patent “%”	“%” means percent by weight of the final product.
Claim 13, '818 Patent; Claim 6, '561 Patent “synthetic rubber”	“synthetic rubber” means rubber manufactured from petroleum and other chemicals rather than the product of raw rubber extracted from rubber vegetation.
Claim 1, '561 Patent “fully incorporated”	“fully incorporated” means combined so as to be homogenous and stable.
Claim 1, '561 Patent “completely integrated”	“completely integrated” has the same meaning as “fully incorporated.”
Claims 1, 2, and 4, '561 Patent “asphalt medium”	<p>“asphalt medium” means asphalt of any type into which a substance may be added.</p> <p>(The parties have agreed that “asphalt” means a dark bituminous substance that is found in natural beds and is also obtained as a residue in petroleum refining and that consists chiefly of hydrocarbons.)</p>
Claim 1, '561 Patent “bottom portion”	“bottom portion” means an area below a middle portion.
Claim 1, '561 patent “middle portion”	“middle portion” means an area above a bottom portion in which the jet spray nozzles provide sufficient shear to mix the contents.

Claim 1, '561 Patent “jet spray nozzles”	 “jet spray nozzles” means devices or structures with an aperture capable of providing a propulsion spray of the material passing through it.
Claim 5, '561 Patent “mixing”	 “mixing” has its ordinary meaning of “combining” or “blending.”
Claim 7, '561 Patent “blending”	 “blending” has its ordinary meaning of combining or mixing so thoroughly that the constituent parts cannot readily be distinguished from one another.
Claim 7, '561 Patent “polymer material”	 “polymer material” has its ordinary meaning of material made by polymerization.
Claim 8, '561 Patent “holding vessel”	 “holding vessel” is a vessel that receives the incorporated asphalt composition.

A status conference is set for **March 10, 2011, at 5:00 p.m.** to address scheduling issues and Pelican’s motion to amend its answer.

SIGNED on March 7, 2011, at Houston, Texas.


 Lee H. Rosenthal
 United States District Judge